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EXAMINER	
COLUCCI, MICHAEL C	

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2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/725,771	RAO ET AL.
	Examiner	**Art Unit**
	MICHAEL C. COLUCCI	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 20-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 20-32 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 29 April 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 20-32 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 20-22, 24-26, 28, 29, 31, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edler; Bernd Andreas et al. US 6778953 B1 (hereinafter Edler) in view of Lempel; Mody US 6067321 A (hereinafter Lempel).

Re claims 20 and 28, Edler teaches a system for decoding an audio signal, said system comprising:

one or more audio decoding circuits for performing one or more functions on a frame of encoded audio data, wherein the one or more audio decoding functions (Fig. 5 item 650) comprises prediction decoding (Col. 3 lines 33-49);

a bitstream demultiplexer for bitstream demultiplexing the frame of encoded audio data (Col. 2 lines 1-9);

However, Edler fails to teach a memory for storing results of the one or more audio decoding functions comprising prediction decoding on the frame of encoded data (Lempel Col. 6 lines 55-64);

wherein the memory stores the results of bitstream demultiplexing the encoded audio data over at least a portion of the results of the one or more audio decoding functions comprising prediction decoding (Lempel Col. 6 lines 55-64 & Fig. 1).

Lempel teaches that the second macroblock (MB2) is retrieved and the cache memory control unit 27 causes the right half (R2) of the second macroblock (MB2) to be cached in subblock 1 overwriting the left half (L1) of the first macroblock (MB1), and the left half (L2) of the second macroblock (MB2) to be cached in subblock 2. Overwriting the left half (L1) of the first macroblock (MB1) is achieved and has negligible effect on cache hit ratios as there is a very small probability that the left half of MB1 will have any overlap with the reference for the third macroblock (MB3)

Lempel teaches that for every macroblock there are four predictions. For each of the two frame fields dual prime field prediction is performed, except that the prediction area is a 16.times.8 area as opposed to a 16.times.16 area. Thus, the four predictions are the same parity and opposite parity for the top field of the P frame and the same parity and opposite parity for the bottom field of the P frame. The dual prime prediction for P frames mode of operation utilizes both cache memory units 102 and 122 respectively. Memory unit 102 holds the two predictions from the top reference field and memory unit 122 hold the two predictions from the bottom reference field (Col. 11 lines 55-67)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a memory that stores the results of bitstream demultiplexing the encoded audio data over at least a portion of the results of the one or more audio decoding functions comprising prediction decoding for the purposes of avoiding significant overlap, wherein a portion of the data is preserved and predictions can continuously be made without effecting cache memory transactions.

Re claims 21 and 29, Edler teaches the method of claim 20, further comprising:

a Huffman decoder for Huffman decoding the frame of encoded audio data (Col. 4 lines 54-62);

wherein the memory stores results of Huffman decoding the encoded audio data (Col. 4 lines 54-62)

However, Edler fails to teach storing in the memory over at least another portion of the results of the one or more audio decoding functions comprising decoding (Lempel Col. 6 lines 55-64);

wherein the memory stores the results of bitstream demultiplexing the encoded audio data over at least a portion of the results of the one or more audio decoding functions comprising prediction decoding (Lempel Col. 6 lines 55-64 & Fig. 1).

Lempel teaches that the second macroblock (MB2) is retrieved and the cache memory control unit 27 causes the right half (R2) of the second macroblock (MB2) to be cached in subblock 1 overwriting the left half (L1) of the first macroblock (MB1), and the left half (L2) of the second macroblock (MB2) to be cached in subblock 2. Overwriting

the left half (L1) of the first macroblock (MB1) is achieved and has negligible effect on cache hit ratios as there is a very small probability that the left half of MB1 will have any overlap with the reference for the third macroblock (MB3)

Lempel teaches that for every macroblock there are four predictions. For each of the two frame fields dual prime field prediction is performed, except that the prediction area is a 16.times.8 area as opposed to a 16.times.16 area. Thus, the four predictions are the same parity and opposite parity for the top field of the P frame and the same parity and opposite parity for the bottom field of the P frame. The dual prime prediction for P frames mode of operation utilizes both cache memory units 102 and 122 respectively. Memory unit 102 holds the two predictions from the top reference field and memory unit 122 hold the two predictions from the bottom reference field (Col. 11 lines 55-67)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention Huffman decoding the encoded data in the memory over at least another portion of the results of the one or more audio decoding functions comprising decoding for the purposes of avoiding significant overlap, wherein a portion of the data is preserved and predictions can continuously be made without effecting cache memory transactions.

Re claim 22, Edler teaches the system of claim 20, wherein the one or more audio decoding circuits (Fig. 5 item 650) further comprises a prediction decoder for performing the prediction decoding function (Col. 3 lines 33-49).

Re claims 24 and 31, Edler teaches the system of claim 22, wherein the one or more audio decoding circuits further comprise a filter bank (Col. 4 lines 30-62).

Re claims 25 and 32, Edler teaches the system of claim 22, wherein the one or more circuits further comprises a temporal noise shaper (Col. 4 lines 30-62).

Re claim 26, Edler teaches a system for decoding an audio signal, said system comprising:

a first audio decoding circuit for performing a first audio function (Fig. 5 item 650) on a frame of encoded audio data, wherein the first audio decoding circuit is selected from a group consisting of an inverse quantizer for inverse quantizing the frame of encoded audio data (Col. 4 lines 54-62), a bitstream demultiplexer for demultiplexing the frame of encoded audio data (Col. 2 lines 1-9), and a filter bank for filtering the frame of encoded audio data (Col. 4 lines 30-62);

a second audio decoding circuit for performing a second audio function (Fig. 5 item 650) on a frame of encoded audio data, wherein the second audio decoding circuit is selected from a group consisting of a bitstream demultiplexer for demultiplexing the frame of encoded audio data (Col. 2 lines 1-9), a filter bank for filtering the frame of encoded audio data, and an intensity coupler for intensity coupling the frame of encoded audio data (Col. 4 lines 30-62);

a memory for storing outputs of the first audio decoding circuit (Lempel Col. 6 lines 55-64 & Fig. 1);

wherein the memory stores the outputs of the second audio decoding circuit over at least a portion of the results of the first audio decoding circuit (Lempel Col. 6 lines 55-64 & Fig. 1)

Lempel teaches that the second macroblock (MB2) is retrieved and the cache memory control unit 27 causes the right half (R2) of the second macroblock (MB2) to be cached in subblock 1 overwriting the left half (L1) of the first macroblock (MB1), and the left half (L2) of the second macroblock (MB2) to be cached in subblock 2. Overwriting the left half (L1) of the first macroblock (MB1) is achieved and has negligible effect on cache hit ratios as there is a very small probability that the left half of MB1 will have any overlap with the reference for the third macroblock (MB3)

Lempel teaches that for every macroblock there are four predictions. For each of the two frame fields dual prime field prediction is performed, except that the prediction area is a 16.times.8 area as opposed to a 16.times.16 area. Thus, the four predictions are the same parity and opposite parity for the top field of the P frame and the same parity and opposite parity for the bottom field of the P frame. The dual prime prediction for P frames mode of operation utilizes both cache memory units 102 and 122 respectively. Memory unit 102 holds the two predictions from the top reference field and memory unit 122 hold the two predictions from the bottom reference field (Col. 11 lines 55-67)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a memory that stores the outputs of the second audio decoding circuit over at least a portion of the results of the first audio decoding circuit for the purposes of avoiding significant overlap, wherein a portion of the data is preserved and predictions can continuously be made without effecting cache memory transactions.

4. Claims 23, 27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edler; Bernd Andreas et al. US 6778953 B1 (hereinafter Edler) in view of Lempel; Mody US 6067321 A (hereinafter Lempel) and further in view of Araki; Tadashi US 6456963 B1 (hereinafter Araki).

Re claims 23 and 30, Edler in view of Lempel fails to teach system of claim 22, wherein the one or more audio decoding circuits further comprises an intensity coupling circuit (Araki Col. 2 lines 17-44 & Fig. 2).

Araki teaches an audio signal input to the AAC encoder is a sequence of blocks of samples which are produced along the time axis such that adjacent blocks overlap with one another. A gain control 72 and the filter bank 73 map the blocks of the audio signal into the frequency domain through MDCT (Modified Discrete Cosine Transform). A TNS (Temporal Noise Shaping) 74 and a predictor 76 perform predictive coding. An intensity/coupling 75 and an MS stereo (Middle Side Stereo) (abbreviated as M/S, hereinafter) 77 perform stereophonic correlation coding. Then, scalefactors are determined by a scalefactor module 78, and a quantizer 79 quantizes the audio signal based on the scalefactors. The scalefactors correspond to the allowable distortion level

shown in FIG. 1, and are determined for the respective scalefactor bands. After the quantization, based on a predetermined Huffman-code table, a noiseless coding module 80 provides Huffman codes for the scalefactors and for the quantized values, and performs noiseless coding. Finally, a multiplexer 81 forms a code bitstream.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention audio decoding comprising an intensity coupling circuit for the purposes of predictive coding, wherein scalefactors can be determined based on the intensity coupling to decode a bitstream of audio data.

Re claim 27, Edler teaches the system of claim 26, wherein the first audio decoding circuit comprises a filter bank (Col. 4 lines 30-62) for filtering the frame of encoded audio data and wherein the second audio decoding circuit (Fig. 5 item 650) comprises a bitstream demultiplexer (Col. 2 lines 1-9), and further comprising:

However, Edler fails to teach wherein the memory stores the output of the intensity coupler over at least a portion of the results of the second audio decoding circuit (Lempel Col. 6 lines 55-64 & Fig. 1).

Lempel teaches that the second macroblock (MB2) is retrieved and the cache memory control unit 27 causes the right half (R2) of the second macroblock (MB2) to be cached in subblock 1 overwriting the left half (L1) of the first macroblock (MB1), and the left half (L2) of the second macroblock (MB2) to be cached in subblock 2. Overwriting the left half (L1) of the first macroblock (MB1) is achieved and has negligible effect on

cache hit ratios as there is a very small probability that the left half of MB1 will have any overlap with the reference for the third macroblock (MB3)

Lempel teaches that for every macroblock there are four predictions. For each of the two frame fields dual prime field prediction is performed, except that the prediction area is a 16.times.8 area as opposed to a 16.times.16 area. Thus, the four predictions are the same parity and opposite parity for the top field of the P frame and the same parity and opposite parity for the bottom field of the P frame. The dual prime prediction for P frames mode of operation utilizes both cache memory units 102 and 122 respectively. Memory unit 102 holds the two predictions from the top reference field and memory unit 122 hold the two predictions from the bottom reference field (Col. 11 lines 55-67)

However, Edler in view of Lempel fails to teach an intensity coupler for intensity coupling the frame of encoded audio data (Araki Col. 2 lines 17-44 & Fig. 2).

Araki teaches an audio signal input to the AAC encoder is a sequence of blocks of samples which are produced along the time axis such that adjacent blocks overlap with one another. A gain control 72 and the filter bank 73 map the blocks of the audio signal into the frequency domain through MDCT (Modified Discrete Cosine Transform). A TNS (Temporal Noise Shaping) 74 and a predictor 76 perform predictive coding. An intensity/coupling 75 and an MS stereo (Middle Side Stereo) (abbreviated as M/S, hereinafter) 77 perform stereophonic correlation coding. Then, scalefactors are determined by a scalefactor module 78, and a quantizer 79 quantizes the audio signal based on the scalefactors. The scalefactors correspond to the allowable distortion level

shown in FIG. 1, and are determined for the respective scalefactor bands. After the quantization, based on a predetermined Huffman-code table, a noiseless coding module 80 provides Huffman codes for the scalefactors and for the quantized values, and performs noiseless coding. Finally, a multiplexer 81 forms a code bitstream.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a memory that stores the results of bitstream demultiplexing the encoded audio data over at least a portion of the results of the one or more audio decoding functions comprising prediction decoding for the purposes of avoiding significant overlap, wherein a portion of the data is preserved and predictions can continuously be made without effecting cache memory transactions. It would have also been obvious to one of ordinary skill in the art at the time of the invention audio decoding comprising an intensity coupling circuit for the purposes of predictive coding, wherein scalefactors can be determined based on the intensity coupling to decode a bitstream of audio data.

Conclusion

Continued Examination Under 37 CFR 1.114

5. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/14/2008 has been entered.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 20030163327 A1, US 5890112 A, US 6330644 B1, US 20030208359 A1, US 20010029446 A1, US 5734822 A, US 6823310 B2, US 5809466 A, US 6885992 B2, US 5867819 A, US 20020103635 A1, US 5687191 A, US 6772111 B2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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